

MODELING OF TRANSIENT TEMPERATURE CHANGE IN FINNED TUBE HEAT EXCHANGER

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ABSTRACT

A transient one dimensional simulation of a finned tube heat exchanger was carried out to demonstrate the temperature variation and flow paths on the finned or tube sides. The finned tube heat exchanger model can also be used in cycle analysis where it is used in conjunction with other models. The objective of the simulation is to simulate the response of a finned tube heat exchanger to a specified temperature and pressure transient. Elements represent either the flow paths on the finned or tube sides were built up from an integrated network, or they model the heat transfer from the fluid on the tube side, through the tube wall and fins to the fluid on the finned side. Intersection between the finned side fluid path and the tube side fluid path is considered as a control volume. The thermal inertia of the solid tube wall and fin material and the fluid volume were taken into account in the modeling of transient simulations. It is shown that incorporating such simulation emphasizes that the tube wall temperature and the finned side air temperature stays constant for each tube pass through the heat exchanger.

KEYWORDS: Transient Temperature, Heat Exchanger, Finned Tube, Transient Model